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ABSTRACT

In fall 1991, Solano Community College (California) undertook a study comparing the writing skills of students in an integrated course combining history and freshman English composition with students in unpaired history and English classes. Students were divided into three groups: the integrated class and two control groups, one taking history only and one taking history and composition as separate courses. The results of two essays written in the 4th and 13th weeks by the three history classes were examined. Distributions of essay scores and final grades indicated that the integrated class methodology improved student learning in both writing and history, especially among serious students. The evidence further indicates an increased likelihood of success in history for those students who have already taken a college composition class, and underscores the value of discussing readings in class to effective writing in history. Appendixes contain essay exam questions; essay scoring criteria; statistical test data; tables of means for groups with and without drops; and a list of data gathered for the whole study population. (JSP)

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CLASSROOM RESEARCH:
WRITING ASSESSMENT IN PAIRED AND SEPARATE
HISTORY AND ENGLISH CLASSES

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Paper Presented to
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I. INTRODUCTION

Like faculty of community colleges across the U.S., Solano faculty in a variety of disciplines complain that their students can't write adequately despite an English curriculum which includes both developmental composition classes and a required college-level composition course. These courses have the purpose of teaching students how to write the essays and essay exams that will be assigned in their other college classes. Still, because they assume (usually correctly) that their students can't handle college-level writing, social science--and other discipline--instructors often reduce or eliminate assignments which require students to write coherent sustained prose. Thus, students are denied opportunities to build their reading and writing skills outside of their English classes, a situation which creates a downward spiral in literacy demands across community college campuses.

One solution for student writing problems that gained great popularity in the 1980s is the bringing together of composition and content instruction in various programs collectively referred to as Writing Across the Curriculum. After a decade of assisting various faculty develop writing assignments for their classes through Solano College's Writing Across the Curriculum program, English instructor Susan Messina found a U.S. history instructor, Diane White, who was interested in actually combining the teaching of her class with the traditional college composition course, English 1. The first paired course was offered in Fall 1989 and was followed by a second semester of the history/English pair and a new pairing of Biology/English (taught by John Nogue and Nan Wishner) in Spring 1990. Sabbatical and academic leaves made it impossible to offer the paired courses in 1990-91, but both pairs were offered again in the Fall 1991 semester.

Recognizing the importance of reading and writing in the

learning process, all of the paired course instructors believe that students will learn more about both their academic subjects when they do so in an integrated context. In the paired context, the English student has a subject to write about, often a problem for freshman writers, and the history student learns not only that good writing is important and necessary in the content areas, but also how to structure an essay so that it will coherently demonstrate her/his understanding of the historical issue. In addition, students in the integrated courses learn strategies that enable them to use writing and reading to learn the content material and concepts. Finally, integrated course students discover that good writing is necessary in all academic areas, not just English.

The same thirty students take both classes; English 1 is scheduled for 12:00 and History 17 at 1:00 in the same room, but in reality the curriculum is completely integrated, and the two instructors intermix history and composition instruction throughout the two-hour period. All of the essays for English 1 are written about the books and topics studied in History 17. Both instructors grade all of the essays; although students earn separate grades, one in history, one in English, the majority of the criteria for evaluating the essays are integrated.

Purpose and Hypothesis

In the first semesters of the paired teaching, all of the instructors believed that their students learned more in the integrated class environment, but had no evidence that that was the case. In order to document for themselves, for counselors advising students about the classes, and for administrators considering the usefulness of these paired classes, whether students in the paired class did indeed learn more and develop better writing competence than they would have in separate classes, the instructors wanted to compare these classes with traditional, unpaired classes.

The purpose of this study was to investigate the writing skills of students in the integrated class compared with the writing skills of students in unpaired history and English classes, as demonstrated in essays written about history. The working hypothesis was that the integrated class students would show a greater increase in writing competence and in history knowledge than the unpaired class students when scores on the first and second essays were compared.

Research Questions

The research questions were

1) Is there any evidence that students in the treatment class write more competently than students in the exact control group?

2) Is there any indication that having completed college composition (English 1) before taking history leads to improved writing in history?

The research team defined competence in writing and history as

those characteristics identified by the evaluators before scoring the essays; these specific criteria are listed in Appendix II.

Assumptions

One assumption in this study is that there is a cause-effect relationship between writing competence in a content area class and writing instruction in a college composition class. A second assumption is that students do not normally make the transfer of writing competence to their content area courses easily.

II. METHODOLOGY

Design

This study investigated results of two essays written in three U.S. history classes (two control classes and one treatment class) in Fall Semester 1991. The first essay was written in the fourth week before any writing instruction occurred in the treatment class, and the second research essay was written in the thirteenth week after four essays had been written by the English class. All three classes read the same materials and wrote on the same topic during the same week in the semester. Both sets of essays were holistically scored by a team of the three history teachers, the paired class writing instructor, and two other composition instructors from the English department. Scores of the control group were compared with scores of the paired (treatment) class to see if greater improvement resulted from the integrated class method of instruction. This study also looked at final grades in the control and treatment classes to see if there was any difference in proportion of letter grades.

Populations

The total population of this study was 110 Solano Community College students all taking History 17, a survey of U.S. history from the Colonial period to the Civil War. The treatment population is one integrated English 1/History 17 class team-taught by the two researchers. The control group population consists of two sections of History 17 taught by other Solano College history instructors, Richard Green (Social Sciences Division Chair) and Van Forsyth. Additionally, an exact control group was selected from the larger control group, consisting of those history students in the two control classes who were also taking English 1 simultaneously, but separately, in the same semester. Thus, they were getting the same two writing and history courses, but not in an integrated instructional situation; this group is the most similar--and therefore valid--comparison group for the treatment group. In addition, subgroups were identified from transcripts that consist of students who have taken fewer than 6 units (termed First Semester), students who have taken one or more composition classes already, students who have already completed English 1 and/or more advanced English classes, and students who have taken no or only developmental composition classes already.

Table 1. Group Populations

Group	Number of Students at 4th Week	13th Week
Whole Treatment Group: White/Messina	27	15
Control Group: Forsyth	47	37
Green	36	24
Whole Control Group:	83	61
Exact Control Group	16	13
Total Study Population	110	75
First Semester Treatment	21	12
First Semester Exact Control	6	5
First Semester Whole Control	18	15
Whole Control Composition Completed (WCCC)	42	33
WCCC-Completed English 1	29	21
WCCC-Completed English 2 or higher class	13	12
Whole Control No or Low Level Composition Completed	23	13

Because only those students who completed both essays can be said to have completed the study requirements, all data reported and discussed below will be for the group who did write both essays. A table of means including those who wrote only Essay I as scores of zero in Essay II means is attached in Appendix IV.

Instruments

Two essay questions were devised by the committee of six instructors who were also the evaluation team for the essays. The committee consisted of six Solano College instructors: Diane White, Richard Green, and Van Forsyth from history; and Susan Messina, Kathy Rosengren (Language Arts division chair), and Sharyn Stever, another English instructor. All instructors have had many years of experience teaching and evaluating writing in their respective fields.

The first essay question was on two articles about New England Puritanism assigned for student reading. The second essay question was about nineteenth century American slavery and was based on the student reading of The Slave Community by John Blasingame.

The two essay questions are attached in Appendix I.

Procedure

In the fourth week, before English instruction in writing began in the treatment class, a baseline essay (Essay I) was written on the topic of New England Puritanism; students in all three history classes read the same two essays, listened to one lecture of similar content by each of the three history instructors, and wrote on the same question. After paired class

English instruction about how to write essays and the writing of four essays, the second research essay, the fifth in the semester in the treatment class, was written. As in the first essay, students in all three classes wrote for one class period of 50 minutes, and notes, articles, and books were allowed. Students did not know what the topic would be before the essay writing session.

Both the baseline and the second essay were holistically evaluated by the research committee of three history instructors and three English instructors. Prior to the evaluation session, the research committee agreed upon general criteria for excellence (see Appendix II). It was decided that a scale of 1 to 6 would be used, with 1 identifying the poorest essays and 6 identifying the best essays. Three sets of essays were chosen by the two researchers as exemplifying essays at each of the score levels through a quick reading of approximately half of the whole set of essays. Then discussion among the six evaluators led to agreement about what characteristics were typical of essays at each score level in this process known in holistic scoring as "norming."

Immediately following the approximately two-hour norming session, the evaluators read all of the essays and scored them in the range of 1 to 6. Every essay was read at least twice, once by an English instructor and once by a history instructor. The readings were done completely blindly; cover sheets with any identifying student or instructor names had been removed. A random code number had been assigned before the first reading to all students who wrote the baseline essay, and the same code number was used to identify students in the second essay. Thus, none of the evaluators knew which class any given essay had come from. To prevent influence from one evaluator to the next, all scores were covered by stickers before the second evaluator read the papers. After two readings, one researcher uncovered the scores and determined which essays had met with agreement amongst readers. Those papers on which the first two readers had not agreed on a score were read again until two readers reached agreement, usually with a third reading. When agreement was reached, scores were recorded. The primary data in this project thus comes from comparisons of the two essay scores in the treatment and control groups.

Collection of Data

The code numbers, instructor name, scores on essays 1 and 2, and difference between essays were recorded on a single sheet. Then comprehensive data collection sheets were developed for each of the three classes incorporating the information from the essay scores, academic transcript histories for each student, and self-reported data on a student survey.

From the academic transcripts, the researchers were able to identify those students in the control classes who were taking English 1 in separate classes; these students make up the exact control group. The researchers also identified students'

previous courses in composition or reading from the transcript histories. So few students had taken any reading courses that this data was regarded as insignificant (questions 27, 28, 29, 31, 32, 33), although the generalization that emerged from that evidence is not unimportant: students are not availing themselves of courses which teach them college reading and study skills even when they are faced with a substantial reading load in college classes. Further analysis of the composition histories of the students in the large control group might be useful to the English department.

The researchers had expected to see if there were significant relationships between the essay scores and the 34 variables which were collected for each of the 110 students in the study; however, the data were problematic for many of the variables, so that analysis was not done. See Appendix V for list of data variables.

Some variables did not produce any useful information because there was too much variation, such as major. Others were not significant variables because there was too much similarity; nearly all students in the study reported that their educational goal was to transfer to a four-year school. Most reported that their high school GPA was an A or B average. Almost all students reported that English was their first language. Some information was reported differently on the two sources used to collect data--student information reported to registrar on initial college application and student self-report, so accuracy was determined to be impossible.

Data Processing

The data analysis consists of 1) statistical comparison of mean and median scores of the ten groups and subgroups, 2) percentages of students scoring at each level in the three groups, and 3) an analysis of drops in each group. The Mann-Whitney test was used to compare the median scores between groups taken two at a time; the only assumption about the underlying probability distributions of the groups is that the variances are the same. In contrast, the t-test compares mean scores, assumes a normal distribution, and assumes that the underlying variances are different. The population being studied were not randomly assigned in the treatment and control classes. In all tests, an alpha level of .10 was chosen to test the null hypothesis that the median (mean) of group i was equal to the median (mean) of group j versus the alternative hypothesis that they were not equal.

Limitations

The researchers have identified several significant limitations in the methodology of this study. In a naturalistic classroom setting there will be unmeasurable variation in instruction when four different classroom teachers are involved, and there will be uncontrolled variation in student characteristics such as gender, age, ethnic background, ability,

and number of hours devoted to studying. However, since the elements of the integrated classroom learning environment are complex, it would be impossible to reduce them to a single variable which could be studied in a laboratory situation with all other variables tightly controlled. In a future study, it may be possible to gather more accurate student data in order to do a multivariate analysis to determine if there is a correlation between some of the student variables and essay scores.

Thus, the first limitation is that students were not randomly assigned to treatment and control groups. However, given the current enrollment system at SCC, there is no way to do so. Increasing the number of sections both in the treatment group might allow the researchers to pull large enough subgroups of similar characteristics in an adequate sample size.

The second limitation is that instruction varied in the control and treatment groups, particularly in the first four weeks of the semester. Students in the exact control group probably had already had some instruction, practice, and feedback in writing essays by the time baseline Essay I was given in the fourth week of the semester; their separate English 1 classes had surely completed at least one essay and probably two by the fourth week. However, the treatment group had not had any instruction in writing because it was the researchers' idea to see what the students' writing capabilities were prior to instruction and then measure difference. During the first four weeks, the treatment group had had instruction in reading and had thoroughly read and discussed a monograph on Puritan New England, which was considerably more time and reading on the subject of the first essay than had been spent in the control classes. Thus, both skill and content instruction were different in the first four weeks.

In this study, the fourth week was chosen as the date for writing Essay I because the baseline essay was used as a first midterm exam in the control history classes so that there would be adequate and equal motivation in the both the control and treatment classes. The easiest solution to this limitation is to offer typical English 1 instruction and at least one essay in the treatment class so that the exact control group and the treatment group would be approximately equal in level of instruction prior to the baseline essay. Another solution would be to have all classes write the baseline essay in the first or second week of the semester, which would actually be preferable in terms of getting a truer picture of students' writing capabilities before instruction.

III. FINDINGS

The data utilized in the following tables consist of the mean scores on Essays I and II, the students' enrollment histories taken from transcripts for each student in the study, and final course grades.

The two general research questions were

1. Is there any evidence that students in the treatment class write more competently than students in the exact control group?
2. Is there any indication that having completed college composition (English 1) before taking history leads to improved writing in history?

The answer that emerges from this study is a qualified "yes" to both questions.

Essay Results

The mean scores on Essay I (which was given in the fourth week) are compared with the mean scores on Essay II (which was given in the thirteenth week); in general, the statistical analysis shows a significant difference between the treatment group and the control groups on Essay I, but not on Essay II. The mean degree of improvement between Essay I and Essay II is the last column of data. Because the treatment group scores were relatively higher on Essay I, there is little significant improvement on Essay II for the treatment group. However, there is a significant improvement for Essay II for the control groups.

Two sets of means have been computed, those including "drops," i.e., students who wrote the first essay, but not the second, regardless of whether they dropped the class officially, and those excluding the "drops." Since students drop for a wide variety of reasons, and no research was done on why students dropped, the researchers believe the data excluding the drops is the more valuable for this study; only data on students who took both essays appears in the data below. A data set showing means that include drops is in Appendix IV.

Table 2. Mean Scores on Essays I and II

Line	Group	Number of Students (N)	Mean Score on Essay I	Mean Score Improvement on Essay II
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1.	Whole Treatment	15	3.73	3.87	.14
2.	Whole Control	61	2.69	3.66	.97

1.	Whole Treatment	15	3.73	3.87	.14
3.	Exact Control	13	1.92	3.38	1.46

4.	First Semester Treatment	12	3.75	4.08	.43
5.	First Semester Exact Control	5	2.20	3.80	1.60
6.	First Semester Whole Control	15	2.60	3.33	.73

Both the Mann-Whitney and the t-test show a significant difference between the medians and means of the treatment class compared with the whole control and exact control groups on Essay I; there is also a statistically significant difference between the first semester treatment group and the first semester exact and whole control groups.

Whole Treatment Compared with Exact Control and Whole Control on Essay I.

This is an interesting but unexpected finding. The researchers expected that the exact control group might score higher than the treatment group on Essay I because the control group would have already had four weeks of composition instruction in their separate English 1 classes and would surely have completed at least one essay prior to research Essay I. The serious question which emerges from this finding is why the Treatment group scored so much higher on Essay I. In a deliberate attempt not to teach composition skills before Essay I, the researchers taught reading skills in the first four weeks and the class completed a book on the Puritans, which was the general subject of Essay I, though none of the specific information covered in the Essay I readings was covered in the Treatment group's book on Puritanism. It is possible that this greater degree of background knowledge about Puritanism enabled Treatment students to perform at a higher level on Essay I.

Another possibility is that the Treatment group is of higher average ability, but that question would be difficult to answer because there is no uniform ability measure. The result that the whole control group scored higher than the exact control group did is not surprising when the number of students who have already completed English 1 who are enrolled in the control group classes is considered.

First Semester Treatment Compared with First Semester Control Groups.

One form of student variance the researchers became aware of about halfway through the semester was number of units students have already completed at SCC; the researchers hypothesized that the more experienced students may be less likely to drop midsemester and may perform at higher levels throughout the semester. The treatment group had a much larger proportion of students who were in their first semester compared to the whole control group. However, the pattern of statistically significant difference was the same for the first semester groups as it was for the whole treatment and whole control groups. It is possible this counter-intuitive result would be the opposite if there had not been the four-week reading period in the treatment group.

Informal conversations with treatment group students have revealed that even among students who have remained throughout the semester, the internalization of composition goals came much later in the semester, in the last two essays for some students, particularly for first semester students, which was after the date of the research essay (Essay #5 in the treatment class). What pattern of difference between the whole group and the first semester group might emerge if the essays are given more nearly at the beginning and end of the semester remains to be tested in the next study.

Whole Treatment Compared with Exact Control and Whole Control on Essay II.

Still, the non-significant difference in Essay II scores for the treatment group needs to be accounted for. The researchers hypothesized that the treatment group would score significantly higher on Essay II. Why did that not occur? What circumstances were different for Essay II than for Essay I? It is the belief of the researchers that two problems could account for the difficulty all students had on Essay II: first, the length and difficulty of the Blassingame book, and second, the use of the books during the essay writing period. The structure of the Essay II assignment, which was based on student reading of a book on slavery to be done independently and without class discussion, was too difficult for all but the best students in both the treatment and control groups to handle independently. This, coupled with the evidence of the importance of class discussion of the reading before writing Essay I, leads the researchers to think that a significant change in the nature of how the reading is handled must be made in the methodological design of this

study before replication. Probably as a result of the length and difficulty of the independent book reading assignment for Essay II, there was a difference in the way students used their books while writing Essay II compared to Essay I. Students were allowed to use the articles and book being written about during the essays because students in the treatment class had been allowed to do so in all of their in-class writing. However, the nature of the Essay II topic focused students' attention to specific pages and quotations and asked them to respond with evidence from the rest of the book in the research essay. What the evaluation committee found was an extensive amount of direct quotation from Blassingame without proper quotation or attribution and without enough of the students' own words in developing their ideas. The way the evaluators handled this problem is that scores of 2 or 3 were given to papers which had little of the students' own language and an excess of Blassingame's language. Scores of 4, 5, and 6 were given to papers that did show a student's capability to use and analyze Blassingame's information. Still, it is the opinion of the researchers that this methodology and essay exam administration format did not really give an accurate reflection of any of the students' capabilities to independently read and write about a history text. This methodological problem in this study can be remedied if another study is done. If we want to determine how well students comprehend and remember what they have read and then apply that understanding to writing, we should have allowed them to use only those tools (such as reading notes) which they have created themselves in their reading process.

The Importance of Reading in Writing for History Class.

The unexpected results on both essays lead the researchers to re-examine the role of reading in writing about history. First, one explanation for why the treatment group did better on Essay I is that they had done substantial reading on the essay subject matter (though not the specific topic) which included frequent in-depth class discussion of the ideas in the reading. But then there was no class discussion of reading on the topic of American slavery before Essay II, although there were several lectures on the topic before the essay (both treatment and control classes had similar lectures). Perhaps Solano students need class attention to challenging reading if they are to make use of that material in writing.

Some additional data from the class reading journal assignments help us argue for the positive effect of the reading on the writing. In the treatment group, one semester-long assignment was to keep a reading journal for each of the history monographs; all but one student earning a passing grade in History 17 in the treatment group completed 90 - 100% of the journal assignments, while none of the failing students completed more than 66 % of the reading journal assignments. This data shows the importance of completing the reading as a basis for writing and supports the explanation that the treatment students

performed better on Essay I because they had done more reading on the topic of Puritanism than the control group students had.

Improvement in Scores Between Essays I and II.

Because there was little difference in the scores on Essays I and II in the treatment group (because they scored so high on Essay I), that measure proved not to be as informative for the treatment group as the researchers had hoped it would be. What is interesting about the improvement measure is that even groups who had already completed English 1 showed great improvement between Essay I and Essay II because they had not scored high on Essay I. One wonders why they were not able to muster their composition knowledge for Essay I, a question that could only be answered with a qualitative study.

Research Question One: A Tentative Answer

Although this study does not show a treatment group writing performance on Essay II that is statistically significantly better than the control group, the higher performance on Essay I keeps alive the possibility that the integrated class teaching method might result in improved performance in writing and history knowledge if the research methodology problems were solved in a future study. The researchers are planning to replicate the study in 1992-3 with changes as discussed. The role of reading will have to be clarified in the methodology. It may be that the research question should be revised to include reading as well as writing.

Further data from essay score distributions and final grade distributions analyzed below leads to the conclusion that the integrated teaching method helps serious students advance their writing skills and history knowledge to a greater extent than they might have done in separate classes.

Effect of Prior Writing Class Results.

Research question two asked whether there is any indication that taking a composition class prior to taking a history class improves performance in the history class; the evidence of this study provides a fairly strong positive answer to that question.

Table 3. Mean Scores on Essays I and II: Prior Composition Class Analysis

Line	Group	Number of Students (N)	Mean Score on Essay I	Mean Score Improvement on Essay II	
1.	Whole Treatment	15	3.73	3.87	.14
7.	Whole Control	33	2.88	4.12	1.24
	Composition Completed				
8.	WCCC-Completed	21	2.71	4.43	1.72
	English 1				
9.	WCCC-Completed	12	3.17	3.58	.41
	English 2 or higher				
1.	Whole Treatment	15	3.73	3.87	.14
10.	Whole Control	13	2.69	2.77	.08
	No or Low Composition				
	Class Completed				

The data in Table 3 answers the second research question with a "yes," though it must also be qualified. The highest scorers on Essay II were the students in the subgroup of the Whole Control Composition Completed group who had already completed English 1 before taking History 17, but who had not yet completed a second college level English class, though some were enrolled in one concurrently. This finding would suggest that to gain college level writing competence, it takes not only the full semester of English 1, but also continued writing practice in the context of a content area class. This group scored 2.71 on Essay I and 4.43 on Essay II for a gain of 1.72. The relatively low score on Essay I is curious and unexpected for all three of these Composition Completed groups. One possible explanation is that the criteria for grading included use of the reading material to support the point being made, an approach to writing about history that might have been unfamiliar on Essay I but was understood to be expected by Essay II.

Even more unexpected is the Essay II performance of the Whole Control Composition Completed subgroup which had completed not only English 1 but also a second college level English class; this group, which the researchers expected to perform at the highest level of all the groups, actually scored lower on Essay II than those who had completed just one college level class (English 1) and also lower than the Whole Treatment group. This finding is hard to explain. Perhaps the emphasis on analysis of and writing about literature in the second composition class gets students away from thinking about the organizational patterns

more typical of English 1. Still, more writing experience would have been expected to lead to higher performance.

Nonetheless, the conclusion that having taken a college level composition class does lead to improved writing in history class is also supported by the data from the Whole Control No/Low Composition group. This group is taking History 17 but has taken only a developmental composition class or no composition class at all. English department faculty would expect this group to have a hard time writing adequate essays for History 17, and that is what the data reveals. This group scored a full point below the Treatment group on Essay II and 1.66 points below the group which had already completed English 1, the highest scoring group on Essay II. This group also had the highest drop rate of all the control subgroups; its drop rate is 43%, very similar to the 44% of the Treatment group.

Thus, the low scores of the group which has had low or no composition and the high scores of the group which has already completed English 1 do indicate that taking college level composition before taking History 17 is related to improved writing performance in history class, although the taking of an advanced composition class does not appear to add--indeed, is a slight detriment in this data--to history writing competence. Despite this qualification, the answer to research question 2 appears to be positive based on this study's data.

Comparison of Retention in Treatment and Control Groups

Drops are defined as those students not writing Essay II who did write Essay I, whether or not they officially dropped the class. Drops in the treatment group history class are over 40 %, while drops in the exact control group history class are under 20%.

Table 4. Percentage of Drops in Groups

Group	Percent of Students Not Writing Essay II
1. Whole Treatment	44 %
2. Whole Control	27 %
3. Exact Control	19 %
4. First Semester Treatment	43 %
5. First Semester Exact Control	17 %
6. First Semester Whole Control	17 %
7. Whole Control Composition Completed	21 %
8. Whole Control Composition Completed Eng.1	28 %
9. Whole Control Composition Completed Eng.2	8 %
10. Whole Control No/Low Composition	43 %

Because of this disparity in percentages of drops, which therefore affects the means differently, the researchers have concentrated on comparison of the means without drops included. All discussion of findings is based on the means which include

only those students who wrote both essays. (Further research is needed to discover why the drop rate is higher in the paired class, although an intuitive answer is that paired class students realize they must do all of the reading in order to write the essays, whereas in a lecture class, a satisfactory grade can sometimes be achieved even if all of the reading is not done.)

Comparison of Final Grade Data in Treatment and Control Groups.

Final semester grade data also give some support to the value of the paired class, especially with the qualification that the integrated treatment worked well for those students who did do all, or most, of the reading assigned which was then the subject of the writing in the integrated class.

Table 5. Final Semester Grades in History 17

GROUP	PERCENTAGE OF	A	B	C	D	F	W	I
Treatment		20	20	13	20	27		
Exact Control		15	23	38	8	15		

Table 6. Final Semester Grades in English 1

GROUP	PERCENTAGE OF	A	B	C	D	F	W	I
Treatment		20	20	13	20	27		
Exact Control		8	23	46	0	0	15	8

In both treatment and control history classes, there is a greater percentage of students who remain in the class but fail, compared to the English 1 classes. In the exact control group students who were taking English 1 separately, there is a drop and incomplete percentage that is close to the fail percentage in the paired class. What is substantially different though is the percentage earning A grades; the treatment class had more than twice the number of students who earned A's. Thus, a conclusion can be drawn that the paired class enabled good students to excel to a greater degree than the separate classes did. Also interesting is the larger percentage of C grades in the control group; the C and D grades seem to be separated more distinctly in the treatment class. It is possible that the role of reading completion and comprehension was significant here. That would be an interesting area for qualitative exploration in a future study.

Score Level Distributions

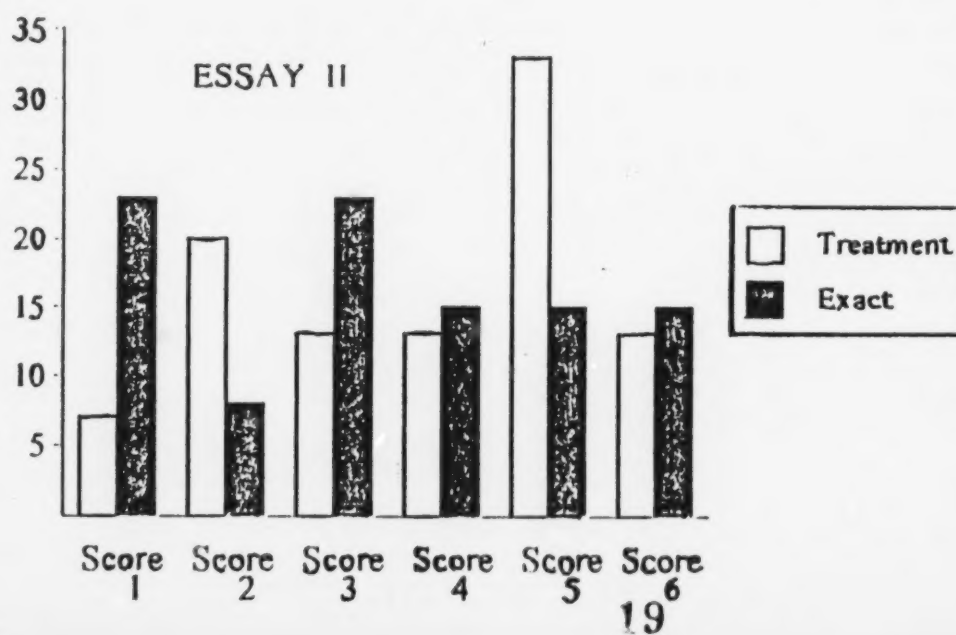
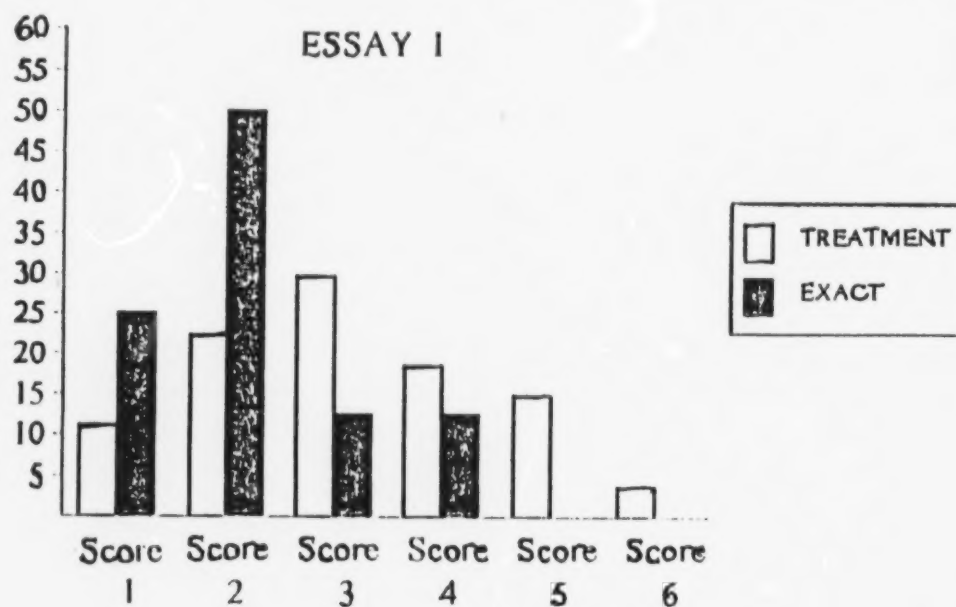
One major concern that emerges from these findings is that all of the groups' scores are lower than 4.00 in Table 1 data (with the exception of the First Semester Treatment group score

on Essay II). When the English Department gives a similar essay exam at the end of developmental composition classes, it regards a score of 4 as the level a student must achieve in order to be ready to enter college composition. The Composition Completed groups (7 and 8) both had Essay II scores of slightly over 4, but interestingly, the group which had completed an advanced English class dropped down to a 3.58 on Essay II, which is an unexpected result.

Table 7 shows the percentage of students scoring at each level on both Essay I and Essay II. On both essays, more treatment group students scored at the 4, 5, and 6 levels in four of the six instances. This data leads us to conclude that the paired instruction environment is indeed correlated with a higher level of writing competence as demonstrated by the greater number of treatment students scoring at levels 4, 5, and 6.

In sum, the final grade data shows support for the superiority of the treatment class for students at the top end of the grade scale.

Table 7. Percentage of Students Scoring at Each Level



IV. INTERPRETATION

While this study did not yield quite the expected results for research question one, it is a promising methodology for investigating Writing Across the Curriculum program effects. Whether the cause of the unexpected findings lies in the research methodology--and it's quite likely that it does, in the opinion of the researchers--or whether this data represents a true and accurate picture of the writing competence developed in the two modes of instruction is not clear. The only way to tell is to replicate the study, correcting the methodological problems and to discover whether similar results occur or whether more improvement is shown in paired class students' writing competence. Research design changes that need to be made include simplifying the writing prompts, changing the timing of the essay administrations to the second and sixteenth weeks of the semester to maximize student learning time, allowing students to use reading notes rather than the texts themselves when they write the essays, using articles rather than book length materials as the subject for the writing, and developing a more refined scoring mechanism. The researchers are part of a grant proposal which would fund such modification and extension of this study.

There is enough evidence in the study, particularly in the distribution of essay scores and final grades, as well as the relatively higher treatment class scores on Essay I, to indicate that the integrated class methodology does improve student learning about both writing and history, especially for serious students. To seek more definitive evidence supporting integrated teaching, we need to replicate the study with the design improvements noted above.

Further, this study brought forth substantive evidence to support research question two, the issue of whether having taken a college composition class increases the likelihood of success in history. The subgroup who had taken a developmental composition course or who had not taken a writing course at all made negligible improvement on Essay II, while those who had already completed college composition wrote at the highest levels on Essay II. Faculty in social science can use this evidence to advise students of appropriate classes to take before taking history or other social sciences.

Finally, this study was very informative with respect to the importance of reading in history. When students read the history texts carefully followed by substantive class discussion, they were able to utilize the information read in writing, as demonstrated by the performance of the treatment group on Essay I. However, when didn't read or the reading was done in isolation without discussion, the students were less able to utilize the information in their writing, as demonstrated in Essay II.

In addition to the quantitative analysis done in this study, further qualitative analysis needs to be done to determine what works and what doesn't for the students in both types of classes.

APPENDIX I: ESSAY EXAM QUESTIONS I AND II

Essay 1: New England Puritanism

Student's Name _____

Student's Social Security Number _____

History Instructor's Name _____

Date _____

(Students: Please fill in the information above the line, but do not write below the line. Thanks.)

Student Code Number _____

Essay I Score _____

Students: Please do not write in these spaces above the double line. Begin reading the topic for your essay below the line. Then write your essay on the lined pages following the topic. If you need more room, write on back of lined page, and write a note at bottom of page 3 to direct reader to your page 4. Please write in ink if possible; neat cross-outs and corrections are quite acceptable. Do not write your name or your instructor's name anywhere on this sheet or on your essay pages.

	Score	Reader Code
First Reading	_____	_____
Second Reading	_____	_____
Third Reading	_____	_____
Fourth Reading	_____	_____

STUDENT CODE NUMBER _____ TOTAL SCORE _____

ESSAY I TOPIC

Mary Rowlandson and Anne Hutchinson lived their experiences in the context of first generation New England Puritanism. Mary Rowlandson's narrative of captivity reflects the Puritan belief that God was "on the Puritan side." Rowlandson was able to use her experience to confirm and strengthen her faith: 'Before I knew what affliction meant, I was sometimes ready to wish for it,' she admitted. 'But now I see the Lord has his time to scourge and chasten me.'" In viewing her trials during captivity as God's testing of her faith, Rowlandson was typical of many Puritans living through their wilderness experience, and her whole community drew upon her experiences to strengthen their faith that God intended their community to prosper as a special example of a community living under the Word of God.

Anne Hutchinson's beliefs and experiences, on the other hand, "challenged" the colony's hierarchical structure and fundamental beliefs. "Her 'ready wit and bold spirit' aroused a fear that moved the founding fathers to an inelegant harshness." She promoted "her own beliefs which differed from those of the Boston ministers." She charged that "the ministers of Boston preached too much that people could be saved only by 'works'--by following the Scriptures and the Ten Commandments." Consequently, her community banished her from the colony.

Although both of these women considered themselves to be good Puritans, they saw their roles as Puritan women differently, and the Puritan community responded to them and their beliefs and experiences differently. Analyze the similarities and differences between Hutchinson and Rowlandson using their beliefs, experiences, and actions to support your explanations. You may use material from lecture and the two readings, as well as what you remember from any other reading you have done on 17th C. Puritans.

Essay 2: 19 th C. American Slavery

Student's Name _____

Student's Social Security Number _____

History Instructor's Name _____

Date _____

(Students: Please fill in the information above the line, but do not write below the line. Thanks.)

Student Code Number _____

Essay 2 Score _____

Students: Read the following topic for your essay. Then write your essay on the lined pages which are attached. If you need more room, write on back of a lined page, and write a note at bottom of page 3 to direct reader to your page 4. Please write in ink if possible; neat cross-outs and corrections are quite acceptable. Do not write your name or your instructor's name anywhere on this sheet or on your essay pages.

ESSAY TOPIC: 19 th C. AMERICAN SLAVERY

Through most of American history, slaves in the pre-Civil War South have been thought of as passive field workers living out their lives with little resistance. This perception has existed in part because of stereotypical descriptions of African American slave life. In The Slave Community, Blassingame challenges this view of slave culture.

In Chapter 6, Blassingame describes a "complex and contradictory portrait of the slave which emerges from antebellum Southern literature" (224). In your essay, compare and contrast Blassingame's description of the stereotypical slave characters, "Sambo, Jack, and Nat," with the realities of slave life and character. In your essay, distinguish among the views about slaves held by white plantation owners, other Southern and Northern whites, and the portrait of real slave culture as presented throughout the book.

As part of your discussion, explain what beliefs and assumptions led to the development and acceptance of each of the stereotypes.

Give examples from The Slave Community to support your points throughout your essay. You are also encouraged to include information from lecture and other reading which would support your analysis.

Students: Please do not write in the spaces below.

	Score	Reader Code
First Reading	_____	_____
Second Reading	_____	_____
Third Reading	_____	_____
Fourth Reading	_____	_____

STUDENT CODE NUMBER _____ TOTAL SCORE _____

APPENDIX II: ESSAY SCORING CRITERIA

HISTORY/ENGLISH WRITING RESEARCH PROJECT
Essay I and Essay II Scoring Criteria

FALL 1991

1. Degree of historical accuracy. This criterion applies throughout whole essay, is to be judged along with each of the following structural criteria.
2. Clear thesis statement showing the point the writer will make.
3. Adequacy of detail and development in support of thesis.
4. Relevance of supporting detail.
5. Adequacy of analysis, how well the writer has explained how and why the support proves the thesis.
6. Clarity of organization and coherence.
7. Adequacy of sentence structure and mechanics to achieve clarity without hindering meaning.

APPENDIX III: STATISTICAL TEST DATA

testing median of group 1 = to group 2
 vs $\neq$ 90% conf. $\alpha=10\%$

MTB > EXECUTE 'B:TEST1.CMD'
 MTB > MANN-WHITNEY 90 'T1' 'S21'

Mann-Whitney Confidence Interval and Test

T1 N = 15 Median = 4.000
 S21 N = 61 Median = 3.000
 Point estimate for ETA1-ETA2 is 1.000
 90.3 pct c.i. for ETA1-ETA2 is (-0.001,2.000)
 W = 789.5

Test of ETA1 = ETA2 vs. ETA1 n.e. ETA2 is significant at 0.0058
 The test is significant at 0.0045 (adjusted for ties)

diff

MTB > MANN-WHITNEY 90 'T1' 'S31'

Mann-Whitney Confidence Interval and Test

T1 N = 15 Median = 4.000
 S31 N = 13 Median = 2.000
 Point estimate for ETA1-ETA2 is 2.000
 90.3 pct c.i. for ETA1-ETA2 is (1.000,2.000)
 W = 294.5

Test of ETA1 = ETA2 vs. ETA1 n.e. ETA2 is significant at 0.0004
 The test is significant at 0.0003 (adjusted for ties)

diff

MTB > MANN-WHITNEY 90 'T1' 'S71'

Mann-Whitney Confidence Interval and Test

T1 N = 15 Median = 4.000
 S71 N = 33 Median = 3.000
 Point estimate for ETA1-ETA2 is 1.000
 90.0 pct c.i. for ETA1-ETA2 is (0.000,2.000)
 W = 459.5

Test of ETA1 = ETA2 vs. ETA1 n.e. ETA2 is significant at 0.0418
 The test is significant at 0.0369 (adjusted for ties)

diff.

MTB > MANN-WHITNEY 90 'T1' 'S81'

Mann-Whitney Confidence Interval and Test

T1 N = 15 Median = 4.000
 S81 N = 21 Median = 3.000
 Point estimate for ETA1-ETA2 is 1.000
 90.5 pct c.i. for ETA1-ETA2 is (-0.000,1.999)
 W = 348.0

Test of ETA1 = ETA2 vs. ETA1 n.e. ETA2 is significant at 0.0247
 The test is significant at 0.0213 (adjusted for ties)

diff.

MTB > MANN-WHITNEY 90 'T1' 'S91'

Mann-Whitney Confidence Interval and Test

T1 N = 15 Median = 4.000
 S91 N = 12 Median = 3.000
 Point estimate for ETA1-ETA2 is 1.000
 90.8 pct c.i. for ETA1-ETA2 is (0.001,1.000)
 W = 231.5

same.

Test of ETA1 = ETA2 vs. ETA1 n.e. ETA2 is significant at 0.3055
 The test is significant at 0.2919 (adjusted for ties)
 Cannot reject at alpha = 0.05

MTB > MANN-WHITNEY 90 'T1' 'S101'

Mann-Whitney Confidence Interval and Test

T1 N = 15 Median = 4.000
 S101 N = 13 Median = 3.000
 Point estimate for ETA1-ETA2 is 1.000
 90.3 pct c.i. for ETA1-ETA2 is (0.000,2.000)
 W = 266.0

diff.

Test of ETA1 = ETA2 vs. ETA1 n.e. ETA2 is significant at 0.0270
 The test is significant at 0.0211 (adjusted for ties)

MTB > MANN-WHITNEY 90 'S41' 'S51'

Mann-Whitney Confidence Interval and Test

S41 N = 12 Median = 4.000
 S51 N = 5 Median = 2.000
 Point estimate for ETA1-ETA2 is 2.000
 91.8 pct c.i. for ETA1-ETA2 is (1.000,2.999)
 W = 129.5

diff.

Test of ETA1 = ETA2 vs. ETA1 n.e. ETA2 is significant at 0.0269
 The test is significant at 0.0229 (adjusted for ties)

MTB > MANN-WHITNEY 90 'S41' 'S61'

Mann-Whitney Confidence Interval and Test

S41 N = 12 Median = 4.000
 S61 N = 13 Median = 2.000
 Point estimate for ETA1-ETA2 is 1.000
 90.8 pct c.i. for ETA1-ETA2 is (1.000,2.000)
 W = 222.0

diff.

Test of ETA1 = ETA2 vs. ETA1 n.e. ETA2 is significant at 0.0090
 The test is significant at 0.0067 (adjusted for ties)

Test 2

MTB > MANN-WHITNEY 90 'T2' 'S22'

Mann-Whitney Confidence Interval and Test

T2 N = 15 Median = 4.000
 S22 N = 61 Median = 4.000
 Point estimate for ETA1-ETA2 is -0.000
 90.3 pct c.i. for ETA1-ETA2 is (-1.000,0.999)
 W = 623.0

Test of ETA1 = ETA2 vs. ETA1 n.e. ETA2 is significant at 0.5570
 The test is significant at 0.5485 (adjusted for ties)
 Cannot reject at alpha = 0.05

same

MTB > MANN-WHITNEY 90 'T2' 'S32'

Mann-Whitney Confidence Interval and Test

T2 N = 15 Median = 4.000
 S32 N = 13 Median = 3.000
 Point estimate for ETA1-ETA2 is 1.000
 90.3 pct c.i. for ETA1-ETA2 is (-1.001,1.999)
 W = 233.0

Test of ETA1 = ETA2 vs. ETA1 n.e. ETA2 is significant at 0.4896
 The test is significant at 0.4825 (adjusted for ties)
 Cannot reject at alpha = 0.05

same

MTB > MANN-WHITNEY 90 'T2' 'S72'

Mann-Whitney Confidence Interval and Test

T2 N = 15 Median = 4.000
 S72 N = 33 Median = 4.000
 Point estimate for ETA1-ETA2 is 0.000
 90.0 pct c.i. for ETA1-ETA2 is (-0.999,1.000)
 W = 353.0

Test of ETA1 = ETA2 vs. ETA1 n.e. ETA2 is significant at 0.7555
 The test is significant at 0.7494 (adjusted for ties)
 Cannot reject at alpha = 0.05

same.

MTB > MANN-WHITNEY 90 'T2' 'SB2'

Mann-Whitney Confidence Interval and Test

T2 N = 15 Median = 4.000
 SB2 N = 21 Median = 4.000
 Point estimate for ETA1-ETA2 is -1.000
 90.3 pct c.i. for ETA1-ETA2 is (-1.000,-0.000)
 W = 248.0

Test of ETA1 = ETA2 vs. ETA1 n.e. ETA2 is significant at 0.3521
 The test is significant at 0.3410 (adjusted for ties)
 Cannot reject at alpha = 0.05

same

MTB > MANN-WHITNEY 90 'T2' 'S92'

Mann-Whitney Confidence Interval and Test

T2 N = 15 Median = 4.000
 S92 N = 12 Median = 4.000
 Point estimate for ETA1-ETA2 is 1.000
 90.8 pct c.i. for ETA1-ETA2 is (-1.000,1.000)
 W = 225.0

same

Test of ETA1 = ETA2 vs. ETA1 n.e. ETA2 is significant at 0.4792
 The test is significant at 0.4678 (adjusted for ties)
 Cannot reject at alpha = 0.05

MTB > MANN-WHITNEY 90 'T2' 'S102'

Mann-Whitney Confidence Interval and Test

T2 N = 15 Median = 4.000
 S102 N = 13 Median = 3.000
 Point estimate for ETA1-ETA2 is 1.000
 90.3 pct c.i. for ETA1-ETA2 is (0.000,2.000)
 W = 239.0

diff.

Test of ETA1 = ETA2 vs. ETA1 n.e. ETA2 is significant at 0.0589
 The test is significant at 0.0539 (adjusted for ties)
 Cannot reject at alpha = 0.05

MTB > MANN-WHITNEY 90 'S42' 'S52'

Mann-Whitney Confidence Interval and Test

S42 N = 12 Median = 5.000
 S52 N = 5 Median = 3.000
 Point estimate for ETA1-ETA2 is 0.000
 91.8 pct c.i. for ETA1-ETA2 is (-0.999,2.000)
 W = 109.0

same.

Test of ETA1 = ETA2 vs. ETA1 n.e. ETA2 is significant at 0.9580
 The test is significant at 0.9566 (adjusted for ties)
 Cannot reject at alpha = 0.05

MTB > MANN-WHITNEY 90 'S42' 'S62'

Mann-Whitney Confidence Interval and Test

S42 N = 12 Median = 5.000
 S62 N = 15 Median = 3.000
 Point estimate for ETA1-ETA2 is 1.000
 90.8 pct c.i. for ETA1-ETA2 is (0.001,2.000)
 W = 192.5

same.

Test of ETA1 = ETA2 vs. ETA1 n.e. ETA2 is significant at 0.2416
 The test is significant at 0.2283 (adjusted for ties)
 Cannot reject at alpha = 0.05

MTB > MANN-WHITNEY 90 'TDIFF' 'S2DIFF';
SUBC> ALTERNATIVE=+1.

Mann-Whitney Confidence Interval and Test

TDIFF N = 15 Median = 1.000
S2DIFF N = 61 Median = 1.000
Point estimate for ETA1-ETA2 is -1.000
90.3 pct c.i. for ETA1-ETA2 is (-1.001,0.000)
W = 443.0
Test of ETA1 = ETA2 vs. ETA1 n.e. ETA2 is significant at 0.0803
The test is significant at 0.0723 (adjusted for ties)
Cannot reject at alpha = 0.05

MTB > MANN-WHITNEY 90 'TDIFF' 'S3DIFF';
SUBC> ALTERNATIVE=+1.

Mann-Whitney Confidence Interval and Test

TDIFF N = 15 Median = 1.000
S3DIFF N = 13 Median = 2.000
Point estimate for ETA1-ETA2 is -1.000
90.3 pct c.i. for ETA1-ETA2 is (-2.000,-0.000)
W = 169.5
Test of ETA1 = ETA2 vs. ETA1 n.e. ETA2 is significant at 0.0287
The test is significant at 0.0250 (adjusted for ties)

MTB > MANN-WHITNEY 90 'TDIFF' 'S7DIFF';
SUBC> ALTERNATIVE=+1.

Mann-Whitney Confidence Interval and Test

TDIFF N = 15 Median = 1.000
S7DIFF N = 33 Median = 1.000
Point estimate for ETA1-ETA2 is -1.000
90.0 pct c.i. for ETA1-ETA2 is (-2.000,-0.000)
W = 268.0
Test of ETA1 = ETA2 vs. ETA1 n.e. ETA2 is significant at 0.0277
The test is significant at 0.0234 (adjusted for ties)

MTB > MANN-WHITNEY 90 'TDIFF' 'S8DIFF';
SUBC> ALTERNATIVE=+1.

Mann-Whitney Confidence Interval and Test

TDIFF N = 15 Median = 1.000
S8DIFF N = 21 Median = 2.000
Point estimate for ETA1-ETA2 is -1.000
90.5 pct c.i. for ETA1-ETA2 is (-2.000,-1.000)
W = 188.0
Test of ETA1 = ETA2 vs. ETA1 n.e. ETA2 is significant at 0.0043
The test is significant at 0.0032 (adjusted for ties)

MTB > MANN-WHITNEY 90 'TDIFF' 'S9DIFF';
SUBC> ALTERNATIVE=+1.

Mann-Whitney Confidence Interval and Test

TDIFF N = 15 Median = 1.000
S9DIFF N = 12 Median = 0.500
Point estimate for ETA1-ETA2 is -0.000
90.8 pct c.i. for ETA1-ETA2 is (-1.000,1.000)
W = 200.0
Test of ETA1 = ETA2 vs. ETA1 n.e. ETA2 is significant at 0.6430
The test is significant at 0.6331 (adjusted for ties)
Cannot reject at alpha = 0.05

MTB > MANN-WHITNEY 90 'TDIFF' 'S10DIFF';
SUBC> ALTERNATIVE=+1.

Mann-Whitney Confidence Interval and Test

TDIFF N = 15 Median = 1.000
S10DIFF N = 13 Median = 0.000
Point estimate for ETA1-ETA2 is -0.000
90.3 pct c.i. for ETA1-ETA2 is (-1.000,0.999)
W = 226.5
Test of ETA1 = ETA2 vs. ETA1 n.e. ETA2 is significant at 0.6954
The test is significant at 0.6859 (adjusted for ties)
Cannot reject at alpha = 0.05

MTB > MANN-WHITNEY 90 'S4DIFF' 'S5DIFF'

Mann-Whitney Confidence Interval and Test

S4DIFF N = 12 Median = 1.000
S5DIFF N = 5 Median = 2.000
Point estimate for ETA1-ETA2 is -1.000
91.8 pct c.i. for ETA1-ETA2 is (-3.000,-0.001)
W = 90.0
Test of ETA1 = ETA2 vs. ETA1 n.e. ETA2 is significant at 0.0651
The test is significant at 0.0492 (adjusted for ties)

MTB > MANN-WHITNEY 90 'S4DIFF' 'S6DIFF'

Mann-Whitney Confidence Interval and Test

S4DIFF N = 12 Median = 1.000
S6DIFF N = 15 Median = 0.000
Point estimate for ETA1-ETA2 is 0.000
90.8 pct c.i. for ETA1-ETA2 is (-1.000,1.000)
W = 159.0
Test of ETA1 = ETA2 vs. ETA1 n.e. ETA2 is significant at 0.6783
The test is significant at 0.6699 (adjusted for ties)
Cannot reject at alpha = 0.05

$$M_i = M_j$$

MTB > TWOSAMPLE 90 'T1' 'S21'

TWOSAMPLE T FOR T1 VS S21

	N	MEAN	STDEV	SE MEAN
T1	15	3.73	1.16	0.30
S21	61	2.69	1.20	0.15

90 PCT CI FOR MU T1 - MU S21: (0.47, 1.62)

TTEST MU T1 = MU S21 (VS NE): T= 3.10 P=0.0053 DF= 22

N diff

MTB > TWOSAMPLE 90 'T1' 'S31'

TWOSAMPLE T FOR T1 VS S31

	N	MEAN	STDEV	SE MEAN
T1	15	3.73	1.16	0.30
S31	13	1.923	0.862	0.24

90 PCT CI FOR MU T1 - MU S31: (1.15, 2.47)

TTEST MU T1 = MU S31 (VS NE): T= 4.72 P=0.0001 DF= 25

N diff

MTB > TWOSAMPLE 90 'T1' 'S71'

TWOSAMPLE T FOR T1 VS S71

	N	MEAN	STDEV	SE MEAN
T1	15	3.73	1.16	0.30
S71	33	2.88	1.32	0.23

90 PCT CI FOR MU T1 - MU S71: (0.21, 1.50)

TTEST MU T1 = MU S71 (VS NE): T= 2.26 P=0.031 DF= 30

N diff

MTB > TWOSAMPLE 90 'T1' 'S81'

TWOSAMPLE T FOR T1 VS S81

	N	MEAN	STDEV	SE MEAN
T1	15	3.73	1.16	0.30
S81	21	2.71	1.35	0.29

90 PCT CI FOR MU T1 - MU S81: (0.31, 1.73)

TTEST MU T1 = MU S81 (VS NE): T= 2.43 P=0.021 DF= 32

N diff

MTB > TWOSAMPLE 90 'T1' 'S91'

TWOSAMPLE T FOR T1 VS S91

	N	MEAN	STDEV	SE MEAN
T1	15	3.73	1.16	0.30
S91	12	3.17	1.27	0.37

90 PCT CI FOR MU T1 - MU S91: (-0.25, 1.38)

TTEST MU T1 = MU S91 (VS NE): T= 1.20 P=0.24 DF= 22

Y same

MTB > TWOSAMPLE 90 'T1' 'S101'

TWOSAMPLE T FOR T1 VS S101

	N	MEAN	STDEV	SE MEAN
T1	15	3.73	1.16	0.30
S101	13	2.692	0.855	0.24

90 PCT CI FOR MU T1 - MU S101: (0.39, 1.69)

TTEST MU T1 = MU S101 (VS NE): T= 2.72 P=0.012 DF= 25

N diff

MTB > TWOSAMPLE 90 'S41' 'S51'

TWOSAMPLE T FOR S41 VS S51

	N	MEAN	STDEV	SE MEAN
S41	12	3.750	0.945	0.28
S51	5	2.20	1.10	0.49

90 PCT CI FOR MU S41 - MU S51: (0.45, 2.65)

TTEST MU S41 = MU S51 (VS NE): T= 2.75 P=0.033 DF= 6

35

N diff

$$\mu_i = \mu_j$$

N diff.

MTB > TWOSAMPLE 90 'S41' 'S61'
 TWOSAMPLE T FOR S41 VS S61

	N	MEAN	STDEV	SE MEAN
S41	12	3.750	0.965	0.28
S61	15	2.600	0.986	0.25

 90 PCT CI FOR MU S41 - MU S61: (0.50, 1.80)
 TTEST MU S41 = MU S61 (VS NE): T= 3.05 P=0.0057 DF= 23

Begin
Test 2

MTB > TWOSAMPLE 90 'T2' 'S22'
 TWOSAMPLE T FOR T2 VS S22

	N	MEAN	STDEV	SE MEAN
T2	15	3.87	1.60	0.41
S22	61	3.66	1.38	0.18

 90 PCT CI FOR MU T2 - MU S22: (-0.56, 0.99)
 TTEST MU T2 = MU S22 (VS NE): T= 0.47 P=0.64 DF= 19

Y same

MTB > TWOSAMPLE 90 'T2' 'S32'
 TWOSAMPLE T FOR T2 VS S32

	N	MEAN	STDEV	SE MEAN
T2	15	3.87	1.60	0.41
S32	13	3.38	1.80	0.50

 90 PCT CI FOR MU T2 - MU S32: (-0.63, 1.59)
 TTEST MU T2 = MU S32 (VS NE): T= 0.74 P=0.46 DF= 24

Y same

MTB > TWOSAMPLE 90 'T2' 'S72'
 TWOSAMPLE T FOR T2 VS S72

	N	MEAN	STDEV	SE MEAN
T2	15	3.87	1.60	0.41
S72	33	4.12	1.14	0.20

 90 PCT CI FOR MU T2 - MU S72: (-1.04, 0.54)
 TTEST MU T2 = MU S72 (VS NE): T= -0.56 P=0.58 DF= 20

Y same

MTB > TWOSAMPLE 90 'T2' 'S82'
 TWOSAMPLE T FOR T2 VS S82

	N	MEAN	STDEV	SE MEAN
T2	15	3.87	1.60	0.41
S82	21	4.43	1.21	0.26

 90 PCT CI FOR MU T2 - MU S82: (-1.40, 0.28)
 TTEST MU T2 = MU S82 (VS NE): T= -1.15 P=0.26 DF= 24

Y same.

MTB > TWOSAMPLE 90 'T2' 'S92'
 TWOSAMPLE T FOR T2 VS S92

	N	MEAN	STDEV	SE MEAN
T2	15	3.87	1.60	0.41
S92	12	3.583	0.793	0.23

 90 PCT CI FOR MU T2 - MU S92: (-0.53, 1.10)
 TTEST MU T2 = MU S92 (VS NE): T= 0.60 P=0.55 DF= 21

Y same.

MTB > TWOSAMPLE 90 'T2' 'S102'
 TWOSAMPLE T FOR T2 VS S102

	N	MEAN	STDEV	SE MEAN
T2	15	3.87	1.60	0.41
S102	13	2.77	1.17	0.32

 90 PCT CI FOR MU T2 - MU S102: (0.20, 1.99)
 TTEST MU T2 = MU S102 (VS NE): T= 2.09 P=0.047 DF= 25

36

N diff

MTB > TWOSAMPLE 90 'S42' 'S52'

TWOSAMPLE T FOR S42 VS S52

	N	MEAN	STDEV	SE MEAN
S42	12	4.08	1.68	0.48
S52	5	4.00	1.41	0.63

y same

90 PCT CI FOR MU S42 - MU S52: (-1.40, 1.56)

TTEST MU S42 = MU S52 (VS NE): T= 0.10 P=0.92 DF= 8

MTB > TWOSAMPLE 90 'S42' 'S62'

TWOSAMPLE T FOR S42 VS S62

	N	MEAN	STDEV	SE MEAN
S42	12	4.08	1.68	0.48
S62	15	3.33	1.35	0.35

y same.

90 PCT CI FOR MU S42 - MU S62: (-0.28, 1.78)

TTEST MU S42 = MU S62 (VS NE): T= 1.26 P=0.22 DF= 20

MTB > TWOSAMPLE 90 'TDIFF' 'S2DIFF';

SUBC> ALTERNATIVE=+1.

TWOSAMPLE T FOR TDIFF VS S2DIFF

	N	MEAN	STDEV	SE MEAN
TDIFF	15	0.13	1.46	0.38
S2DIFF	61	0.97	1.35	0.17

y

90 PCT CI FOR MU TDIFF - MU S2DIFF: (-1.55, -0.12)

TTEST MU TDIFF = MU S2DIFF (VS GT): T= -2.01 P=0.97 DF= 20

MTB > TWOSAMPLE 90 'TDIFF' 'S3DIFF';

SUBC> ALTERNATIVE=+1.

TWOSAMPLE T FOR TDIFF VS S3DIFF

	N	MEAN	STDEV	SE MEAN
TDIFF	15	0.13	1.46	0.38
S3DIFF	13	1.46	1.39	0.39

y

90 PCT CI FOR MU TDIFF - MU S3DIFF: (-2.25, -0.41)

TTEST MU TDIFF = MU S3DIFF (VS GT): T= -2.46 P=0.99 DF= 25

MTB > TWOSAMPLE 90 'TDIFF' 'S7DIFF';

SUBC> ALTERNATIVE=+1.

TWOSAMPLE T FOR TDIFF VS S7DIFF

	N	MEAN	STDEV	SE MEAN
TDIFF	15	0.13	1.46	0.38
S7DIFF	33	1.29	1.41	0.25

y

90 PCT CI FOR MU TDIFF - MU S7DIFF: (-1.88, -0.34)

TTEST MU TDIFF = MU S7DIFF (VS GT): T= -2.47 P=0.99 DF= 26

MTB > TWOSAMPLE 90 'TDIFF' 'S8DIFF';

SUBC> ALTERNATIVE=+1.

TWOSAMPLE T FOR TDIFF VS S8DIFF

	N	MEAN	STDEV	SE MEAN
TDIFF	15	0.13	1.46	0.38
S8DIFF	21	1.71	1.19	0.26

y

90 PCT CI FOR MU TDIFF - MU S8DIFF: (-2.36, -0.80)

TTEST MU TDIFF = MU S8DIFF (VS GT): T= -3.46 P=1.0 DF= 26

MTB > TWOSAMPLE 90 'TDIFF' 'S9DIFF';
 SUBC> ALTERNATIVE=+1.
 TWOSAMPLE T FOR TDIFF VS S9DIFF

	N	MEAN	STDEV	SE MEAN
TDIFF	15	0.13	1.46	0.38
S9DIFF	12	0.42	1.44	0.42

90 PCT CI FOR MU TDIFF - MU S9DIFF: (-1.25, 0.68)
 TTEST MU TDIFF = MU S9DIFF (VS GT): T= -0.50 P=0.69 DF= 23

Y

MTB > TWOSAMPLE 90 'TDIFF' 'S10DIFF';
 SUBC> ALTERNATIVE=+1.
 TWOSAMPLE T FOR TDIFF VS S10DIFF

	N	MEAN	STDEV	SE MEAN
TDIFF	15	0.13	1.46	0.38
S10DIFF	13	0.08	1.04	0.29

90 PCT CI FOR MU TDIFF - MU S10DIFF: (-0.75, 0.87)
 TTEST MU TDIFF = MU S10DIFF (VS GT): T= 0.12 P=0.45 DF= 25

Y

MTB > TWOSAMPLE 90 'S4DIFF' 'S5DIFF';
 TWOSAMPLE T FOR S4DIFF VS S5DIFF

	N	MEAN	STDEV	SE MEAN
S4DIFF	12	0.33	1.50	0.43
S5DIFF	5	1.800	0.837	0.37

90 PCT CI FOR MU S4DIFF - MU S5DIFF: (-2.48, -0.45)
 TTEST MU S4DIFF = MU S5DIFF (VS NE): T= -2.57 P=0.023 DF= 13

N

MTB > TWOSAMPLE 90 'S4DIFF' 'S6DIFF';
 TWOSAMPLE T FOR S4DIFF VS S6DIFF

	N	MEAN	STDEV	SE MEAN
S4DIFF	12	0.33	1.50	0.43
S6DIFF	15	0.73	1.22	0.32

90 PCT CI FOR MU S4DIFF - MU S6DIFF: (-1.32, 0.52)
 TTEST MU S4DIFF = MU S6DIFF (VS NE): T= -0.75 P=0.46 Df= 21

Y

APPENDIX IV: TABLES OF MEANS FOR GROUPS WITH AND WITHOUT DROPS

Table 2. Mean Scores on Essays I and II

Line	Group	Number of Students (N)	Mean Score on Essay I	Mean Score on Essay II	Improvement
1.	Whole Treatment	27	3.15	2.15	-1.00
	(Without drops)	15	3.73	3.87	.14
2.	Whole Control	83	2.54	2.69	.15
	(Without drops)	61	2.69	3.66	.97
1.	Whole Treatment	27	3.15	2.15	-1.00
	(Without drops)	15	3.73	3.87	.14
3.	Exact Control	16	2.12	2.75	.63
	(Without drops)	13	1.92	3.38	1.46
4.	First Semester Treatment	21	3.24	2.33	.91
	(Without drops)	12	3.75	4.08	.43
5.	First Semester Exact Control	6	2.33	3.17	.84
	(Without drops)	5	2.20	3.80	1.60
6.	First Semester Whole Control	18	2.5	2.78	.28
	(Without drops)	15	2.6	3.33	.73

Table 3. Mean Scores on Essays I and II: Prior Composition Class Analysis

Line	Group	Number of Students (N)	Mean Score on Essay I	Mean Score Improvement on Essay II	
1.	Whole Treatment	27	3.15	2.15	-1.00
	(Without drops)	15	3.73	3.87	.14
7.	Whole Control	42	2.81	3.24	.43
	Composition Completed				
	(Without drops)	33	2.88	4.12	1.24
8.	WCCC-Completed E1	29	2.62	3.21	.59
	(Without drops)	21	2.71	4.43	1.72
9.	WCCC-Completed E2+13		3.23	3.31	.08
	(Without drops)	12	3.17	3.58	.41
1.	Whole Treatment	27	3.15	2.15	-1.00
	(Without drops)	15	3.73	3.87	.14
10.	Whole Control	23	2.17	1.57	- .60
	No/Low Composition	13	2.69	2.77	.08

APPENDIX V: LIST OF DATA GATHERED FOR WHOLE STUDY POPULATION

DATA GATHERED FOR WHOLE STUDY POPULATION

1. History section
2. Score on Baseline Essay (Essay 1)
3. Score on Research Essay (Essay 2)
4. Semester Grade in History 17 (available after 12/20/91)
5. Semester Grade in English 1 (available after 12/20/91)
6. Major
7. Number of years since high school
8. Gender (M or F)
9. Ethnic Background (self-identified)
10. Number of hours of employment per week
11. Importance of college to close others
12. Importance of college to self
13. Educational goals
14. Reason for taking history
15. Reason for taking this section
16. Current SCC GPA
17. High school GPA (self-reported)
18. Previous units attempted at SCC
19. Previous units completed at SCC
20. Assessment test scores in reading
21. Assessment test scores in English (writing)
22. Is English your first language?
23. Date Assessment test taken
24. English "Level" (average of reading and writing assessment test scores)
25. Composition course being taken in current semester?
26. Composition course taken in past?
27. Reading course taken in past?
28. Reading course being taken in current semester?
29. Success level in highest reading course taken?
30. Success level in highest composition course taken?
31. Have you taken the Degrees of Reading Power test in a reading class or reading lab?
32. If yes, what was your score?
33. DRP date taken?
34. Highest level composition course completed with D or CR or above?